Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A two-dimensional radiation detector for a radiographic scanner, the radiation detector comprising:

an anti-scatter module;

a first aligning means for aligning the anti-scatter module with a spatial focus;

a second aligning means for aligning the anti-scatter module;

a detector subassembly module, each detector subassembly module including a substrate and an array of detector elements arranged on the substrate to detect radiation, and

a radiation absorbing mask formed as a grid and arranged between the array of the detector elements and the anti-scatter module; wherein the second aligning means includes alignment pins that align the anti-scatter module with the detector subassembly module

wherein the second aligning means further includes:

alignment openings disposed on the substrate; and

alignment openings disposed on the radiation absorbing mask; wherein

the alignment pins are disposed on the anti-scatter module, such that inserting the pins into the radiation absorbing mask alignment openings and the substrate alignment openings aligns the detector element array with the radiation absorbing mask and the anti-scatter module.

2. (Cancelled)

3. (Currently Amended) The radiation detector as set forth in claim ~~2~~ 1, wherein the radiation absorbing mask is formed of a radiation absorbing material.

4. (Currently Amended) The radiation detector as set forth in claim ~~2~~ 1, further including:

one or more of additional radiation absorbing masks stacked on the alignment pins.

5. (Previously presented) The radiation detector as set forth in claim 4, wherein the radiation absorbing mask has stepped edges, which interleave with stepped edges of adjacent radiation absorbing masks.

6. (Previously presented) The radiation detector as set forth in claim 1, wherein the anti-scatter module includes:

a plurality of anti-scatter vanes formed of a material which is substantially absorbing for radiation produced by the radiographic scanner.

7. (Previously Presented) The radiation detector as set forth in claim 6, wherein the radiation absorbing mask includes:

first strips parallel to the plurality of anti-scatter vanes, which first strips are wider than a thickness of the anti-scatter vanes and are equal or greater than a gap between the elements of the detector array.

8. (Previously Presented) The radiation detector as set forth in claim 6, wherein the radiation absorbing mask includes:

second strips perpendicular to the plurality of anti-scatter vanes, which second strips are of substantially a same dimension as a gap between the detector elements.

9. (Previously presented) The radiation detector as set forth in claim 6, wherein the radiation absorbing mask has stepped edges, which interleave with stepped edges of adjacent radiation absorbing masks.

10. (Previously presented) The radiation detector as set forth in claim 1, wherein the radiation absorbing mask defines precise apertures, which align with and set a resolution of the elements of the detector array.

11. (Previously presented) The radiation detector as set forth in claim 10, wherein the apertures are precisely defined by photochemical etching.

12. (Previously amended) The radiation detector as set forth in claim 1, wherein the detector element array includes:

a scintillation array that produce scintillation events responsive to radiation produced by the radiographic scanner, wherein the scintillation array includes scintillation elements; and

a photodetector element array, each photodetector element of the array being arranged to view one of the scintillation elements of the scintillation array to convert light from the scintillation events into electrical signals.

13. (Currently Amended) The radiation detector as set forth in claim ~~11~~ 12, wherein the scintillation element array is arranged in a two-dimensional rectangular array with a rectangular array of interfaces between adjoining scintillation elements and the radiation absorbing mask includes:

a rectangular array of strips of a radiation absorbent material that defines the grid, the strips overlying interfaces between adjacent scintillation elements.

14. (Previously presented) A computed tomography scanner including:

an x-ray source mounted to rotate about an examination region, the x-ray source emitting a cone shaped x-ray beam from a radiation focal point and traversing the examination region;

a two-dimensional radiation detector which receives the cone beam of radiation that has traversed the examination region, the radiation detector including a plurality of detector modules, each detector module including:

an anti-scatter module, which includes alignment pins,

a detector subassembly module aligned with the anti-scatter module, each detector subassembly module including a substrate and an array of detector elements arranged on the substrate to detect radiation, and

a radiation absorbing mask formed as a grid, the mask being arranged between and aligned with the array of the detector elements and the anti-scatter

module, wherein the alignment pins of the anti-scatter module extend through alignment openings in the mask and alignment openings in the detector subassembly module; and

a reconstruction processor for reconstructing signals from the detector element array into a volumetric image.

15. (Previously presented) A method for manufacturing a radiation detector for a computed tomography scanner, the method comprising:

aligning an anti-scatter module, which includes extending alignment pins, with: a detector subassembly module including a substrate and an array of detector elements arranged on the substrate to detect radiation, and a radiation absorbing mask disposed between the anti-scatter module and the detector elements of the array; and

inserting the alignment pins through alignment openings in the mask and alignment openings in the detector subassembly module.

16. (Previously presented) The method as set forth in claim 15, further including:

forming a radiation absorbing mask by photoetching a radiation opaque material to define a grid.

17. (Cancelled)

18. (Previously presented) The method as set forth in claim 15, wherein the scanner includes an x-ray source on a rotating gantry that produces a cone of x-rays, which pass through an examination region and strike the radiation detector, the method further including:

mounting the anti-scatter module onto the computed tomography scanner, with a spatial focal point of the anti-scatter module being aligned with a focal point of the x-ray source prior to inserting the pins into the alignment openings of the mask and the detector subassembly module.

19. (Previously presented) The method as set forth in claim 15, wherein as the pins are inserted in the alignment openings of the radiation absorbing mask, edges of adjacent radiation absorbing masks are interleaved.

20. (Previously presented) The method as set forth in claim 15, further including:

defining uniform apertures in the radiation absorbing mask to precisely fix an amount of radiation received by each detector element of the array.

21. (Previously presented) A radiation detector of a radiographic scanner, the radiation detector includes a plurality of detector modules, each detector module including:

an anti-scatter module, including a plurality of vanes and alignment pins; and

a rectangular grid including:

a plurality of wider strips, arranged parallel to each other, each wider strip being wider than a width of each vane,

a plurality of thinner strips, the plurality of thinner strips being arranged perpendicular to the wider strips to form uniform openings, each wider strip is aligned with a corresponding vane.

22. (Previously amended) The radiation detector as set forth in claim 21, further including:

a detector array including a plurality of detector elements arranged to form a multi-dimensional rectangular array, each two adjoining detector elements of the array being separated by interfaces, the interfaces are aligned with the rectangular grid to place the grid openings between the vanes and the detector elements of the array to define resolution of the radiographic scanner, wherein the detector array includes a substrate with alignment openings, and the alignment pins of the anti-scatter module lie within and extend through the alignment openings in the substrate of the detector array.

23. (Previously presented) The radiation detector as set forth in claim 1, wherein the radiation absorbing mask grid includes:

a first plurality of strips extending along a first direction; and

a second plurality of strips extending along a second different direction.

24. (Previously presented) The radiation detector as set forth in claim 25, wherein the first direction is perpendicular to the second direction.

25. (Previously presented) ~~The radiation detector as set forth in claim 1,~~ A two-dimensional radiation detector for a radiographic scanner, the radiation detector comprising:

an anti-scatter module;

a first aligning means for aligning the anti-scatter module with a spatial focus;

a second aligning means for aligning the anti-scatter module;

a detector subassembly module, each detector subassembly module including a substrate and an array of detector elements arranged on the substrate to detect radiation, and

a radiation absorbing mask formed as a grid and arranged between the array of the detector elements and the anti-scatter module; wherein the second aligning means includes alignment pins that align the anti-scatter module with the detector subassembly module

wherein the radiation absorbing mask includes first alignment openings and the detector subassembly module includes second alignment openings, and the alignment pins extend through the first alignment openings of the radiation absorbing mask and the second alignment openings of the detector subassembly module.